

**ARIZONA GAME AND FISH DEPARTMENT  
HABITAT PARTNERSHIP COMMITTEE  
HABITAT ENHANCEMENT AND WILDLIFE MANAGEMENT PROPOSAL**

Game Branch / HPC Project Number: 12-505

**PROJECT INFORMATION**

**Project Title:** 96 Hills Water Development Project – Final Phase

**Region and Game Management Unit:** 5/37B

**Local Habitat Partnership Committee (LHPC):**

- Tucson

**Was the project presented to the LHPC?**

**YES**[X] **NO**[]

**Has this project been submitted in previous years?** **YES**[X] **NO**[]

**If Yes, was it funded?** **YES**[X] **NO**[] → **Funded HPC Project #(s):** 07-518, 08-518, 09-525, 10-511, 11-509

**Project Type:** Water Developments - New

**Brief Project Summary:**

This proposal uses a landscape-scale approach to provide permanent long-term wildlife water sources throughout the 96 Hills range in GMU 37B. The 96 Hills represents some of the best mule deer and javelina habitat in the unit. It has been rested for approximately 10 years, grazed only during short periods during spring green-ups. Water, however, is extremely scarce throughout the range and is only present in earthen stock tanks after a heavy monsoon period and during the winter and early spring months and seldom lasts into May. The installation of 7 new water catchments strategically located throughout the range would enable mule deer to take advantage of forage resources currently unavailable due to lack of nearby water. The project would be completed in series of phases (5-6) installing 1-2 catchments per year pending funding and volunteer availability. The 10,000+ gallon systems are either PVC or apron/ring tank systems. Each system will utilize either an R-panel collection apron or a drainage collection point or a combination of the two. Wildlife friendly fences will be installed around each of the developments to exclude livestock. Providing water throughout the range also may potentially increase mule deer and javelina populations which will intern increase hunter opportunity. As stated by Marshal et al. (2006), (water) developments may reduce the need for seasonal movements, make a greater proportion of the range and its forage available to deer, reduce competition for forage in exploited range, decrease risks associated with long-distance movements (e.g., Nicholson et al. 1997, Bleich and Pierce 2001) and, thereby, increase deer abundance (Krausman and Czech 1998).

**Big Game Wildlife Species to Benefit:** Mule deer, javelina, mountain lions

**Implementation Schedule** (Month/Day/Year):

Project Start Date:  
September 1, 2012

Project End Date:  
June 30, 2014

**Environmental Compliance:**

NEPA Completed: **Yes**[X] **No**[] **N/A**[]

Projected Completion Date: \_\_\_\_\_

State Historic Preservation Office - Archaeological Clearance:

**Yes**[X] **No**[] **N/A**[]

Projected Completion Date: \_\_\_\_\_

Arizona Game and Fish Department EA Checklist: **N/A**[]

To be Completed by: Joe Currie

Projected Completion Date: December 2013

PROJECT FUNDING		
Special Big Game License Tag Funds Requested:	\$ 29,357 (28,857+\$500 for monitoring camera)	
Cost Share or Matching Funds:	\$ 20,000	
Total Project Costs:	\$ 49,357	
PARTICIPANT INFORMATION		
Applicant (please print): Ben Brochu	Address: 555 N. Greasewood Rd. Tucson, AZ 85739	E-mail: bbrochu@azgfd.gov
Telephone: 520-591-7636		Date: September 1, 2012
AGFD Contact and Phone No. (If applicant is not AGFD personnel):		
Project has been coordinated with: Ed Jahrke, Joe Currie and ASLD representatives		

#### NEED STATEMENT – PROBLEM ANALYSIS:

Game management unit 37B was once regarded as a premier mule deer unit. Beginning around 1995, mule deer numbers in the unit began to decline. They have not recovered since.

Mule deer numbers and distribution have been declining throughout the West since the latter third of the 20<sup>th</sup> century. To address this concern, the Western Association of Fish and Wildlife Agencies (WAFWA), an organization represented by 17 states and four Canadian provinces, created a Mule Deer Working Group (Group). Using adaptive resource management, the Group sent out to find “solutions to our common mule deer management problems” in the seven different ecoregions in North America. Overall, loss and degradation of habitat was determined to be the single greatest factor that has caused declines in mule deer. In the Southwest Desert Ecoregion, rainfall and competition with livestock were found to be the two biggest limiting factors. The number one recommendation of the Group to improve mule deer management in the Southwest Desert Ecoregion was to **create sources of water in areas where water is limiting** and where other potentially limiting factors are being addressed. Also, consistent with the Group’s recommendation is the Department’s Species Management Guidelines (SMG) which provides goals, objectives, strategies and procedures for a specific species. The SMG outlines four ways to improve and enhance deer habitat to accomplish the overall goal of increasing mule deer populations to levels that provide diverse recreational opportunities. Number one on the list is: Protect and maintain current water sources. Where water is lacking and the distribution and abundance of deer can be influenced, develop **new** water sources.

The 96 Hills represents some of the best mule deer and javelina habitat in the unit. It has been rested for approximately 15 years, grazed only during short periods during spring green-ups. Jojoba (*Simmondsia chinensis*), a critical browse species of mule deer as described below, is abundant throughout the 96 Hills but is underutilized due to a lack of nearby water. The Wildlife Management Handbook, *Managing Desert Mule Deer*, states that browse comprises from 40-70% of the annual diet of mule deer and is especially important in fall, winter and early spring. During droughts browse may contribute up to 90% of the annual diet of mule deer.

Water is a critical component of mule deer habitat. Deer habitat, no matter how attractive, will not be utilized if it is not near a source of water. Water sites should be no more than 2-3 miles apart and

even closer in rough terrain (Wildlife Management Handbook, Managing Desert Mule Deer). WAFWAs Habitat Guidelines for Mule Deer support this suggesting that water sources not be more than 3 miles apart so all mule deer habitat is within 1.5 miles of a permanent water source (Brownlee 1979, Dickinson and Garner 1979). Water is extremely scarce in the range and is only present in earthen stock tanks after a heavy monsoon period and during the winter and early spring months and seldom lasts into May. Marshal et al. (2006) stated that water in the absence of forage and cover likely will not create mule deer habitat, but forage and cover in the absence of water may provide deer habitat, at least seasonally. Thus, catchments might make forage resources, which would otherwise be unavailable, available year-round. Further, where deer might otherwise make seasonal movements between parts of their range with forage and parts with water, developments may reduce the need for seasonal movements, make a greater proportion of the range and its forage available to deer, reduce competition for forage in exploited range, decrease risks associated with long-distance movements (e.g., Nicholson et al. 1997, Bleich and Pierce 2001) and, thereby, increase deer abundance (Krausman and Czech 1998).

### **PROJECT OBJECTIVES:**

- To increase deer and javelina populations by providing dependable, long term, self-sustaining, quality water sources and by increasing the use of otherwise unavailable forage resources
- To increase hunter opportunity
- To install systems that have a long lifespan (40-50 years for storage and collection systems, 25 years for drinking troughs)
- To install systems that do not require supplemental hauling except in rare or exceptional circumstances
- To install systems that have minimal visual impacts and blend in with surrounding landscape
- To install systems that are accessible and that requires minimal routine maintenance
- To monitor the use of these waters using remote digital game cameras

### **PROJECT DESCRIPTION AND STRATEGIES:**

Each project will be completed in one of three ways:

1. Utilize big game special tag funds, personnel from the Arizona Game and Fish Department Development Branch and approximately 15 volunteers to install each of the new systems. One to three systems will be installed per year pending the schedule of the Development Branch and available funds.
2. Pending available big game special tag funds, projects could be contracted out at an increased cost. The total project would be completed in a fraction of the time.
3. Utilize big game special tag funds for the purchase of the system components. Pending availability and willingness use donated volunteer heavy equipment (backhoe) and labor to build the systems. If donated backhoe is not available, one will be rented from Tucson and transported to and from the project site. Development Branch would only be responsible for supplying 1-2 people for project supervision and for transporting the required supplies and specialized equipment to the site. Nearly the entire project would be completed with volunteers.

**Phase 1- 2007/2008 Cycle**

1. Coyote Peak Development (11,700 gallons) – purchase and install the following components:
  - (2) 3’x18’ fiberglass ring tanks
  - (1) 3’x4’ standard walk-in trough
  - (1) 24’x96’ R-panel collection apron
  - 150’x150’ wildlife friendly piperail fence
  - Required plumbing components
  - Remote digital monitoring camera
2. Rock Tank Catchment Development (11,700 gallons) – purchase and install the following components:
  - (2) 3’x18’ fiberglass ring tanks
  - (1) 3’x4’ standard walk-in trough
  - (1) 24’x96’ R-panel collection apron
  - 150’x150’ wildlife friendly piperail fence
  - Required plumbing components
  - Remote digital monitoring camera

**Phase 2 – 2008/2009 Cycle**

3. North 96 Hills Development (11,700 gallons) – purchase and install the following components:
  - (2) 3’x18’ fiberglass ring tanks
  - (1) 3’x4’ standard walk-in trough
  - (1) 24’x96’ R-panel collection apron
  - 150’x150’ wildlife friendly piperail fence
  - (1) 6” collection point and ~ 100’ of 6” Sch40 PVC pipe
  - Required plumbing components
  - Remote digital monitoring camera

**Phase 3 – 2009/2010 Cycle**

4. 96 Ranch #11 Development (11,700 gallons) – purchase and install the following components:
  - (2) 3’x18’ fiberglass ring tanks
  - (1) 3’x4’ standard walk-in trough
  - (1) 24’x96’ R-panel collection apron
  - 150’x150’ wildlife friendly piperail fence
  - (2-3) 6” collection points and ~ 100’ of 6” Sch80 PVC pipe
  - Required plumbing components
  - Remote digital monitoring camera

#### **Phase 4 – 2010/2011 Cycle**

5. Brady Wash Development (10,500 gallons) – purchase and install the following components:
- (4) 24"x100' PVC pipe tanks
  - (1) 3' fiberglass walk-in drinker for PVC system
  - 150'x150' wildlife friendly piperail fence
  - (1-2) 6" collection points and ~ 120' of 6" Sch80 PVC pipe
  - (1) reinforced concrete sediment trap
  - Required plumbing components

#### **Phase 5 – 2011/2012 Cycle**

6. West 96 Hills (10,500 gallons) – purchase and install the following components:
- (4) 24"x100' PVC pipe tanks
  - (1) 3' fiberglass walk-in drinker for PVC system
  - 150'x150' wildlife friendly piperail fence
  - (1-2) 6" collection points and ~ 120' of 6" Sch10 Gruv-lok pipe and ~80' of 4" Sch80 PVC pipe
  - (1) reinforced concrete sediment trap
  - Required plumbing components

#### **Phase 6 (Final) – 2012/2013 Cycle**

7. Prospect Hill (10,500 gallons) – purchase and install the following components:
- (4) 24"x100' PVC pipe tanks
  - (1) 3' fiberglass walk-in drinker for PVC system
  - 150'x150' wildlife friendly piperail fence
  - (1-2) 6" collection points and ~ 180' of 6" Sch10 Gruv-lok pipe and ~90' of 4" Sch80 PVC pipe
  - (1) reinforced concrete sediment trap
  - Required plumbing components

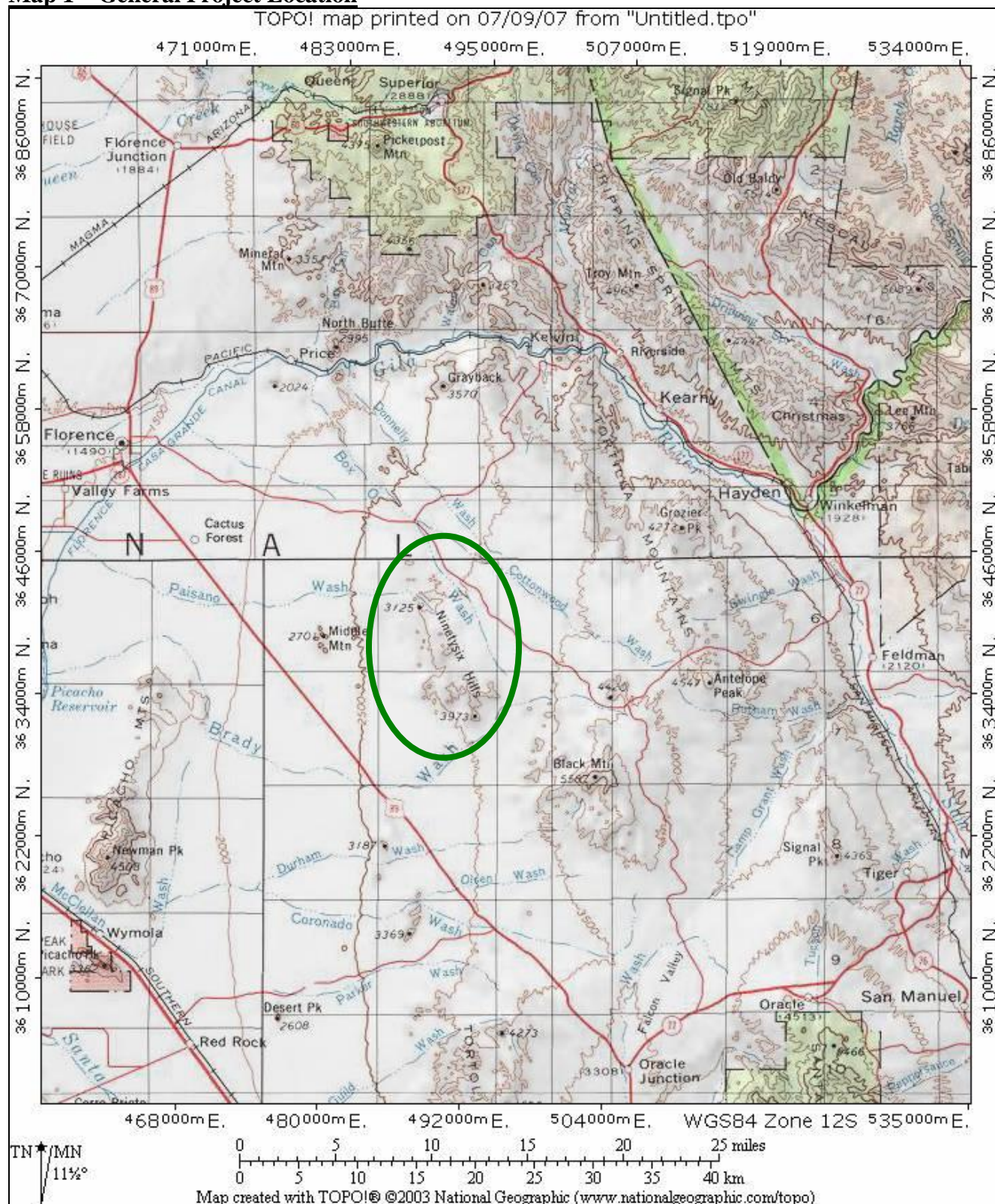
#### **PROJECT LOCATION:**

The 96 Hills range is located in west/central GMU 37B.

- **Map 1** – General project location in **GREEN** within GMU 37B
- **Map 2** – Location of 7 proposed catchments in **RED**. Three existing catchments are noted in **BLUE**.



### Map 1 – General Project Location





YES[] NO[] N/A[]

### HABITAT DESCRIPTION:

Game management unit 37B is located in Pinal County, Arizona, southeast of Phoenix. Two main biotic community types, Sonoran Desertscrub and Semidesert Grassland, comprise the bulk of the habitat in 37B. The catchment locations in the 96 Hills are represented by both community types. Common vegetation includes various types of grama grasses (*Bouteloua spp.*), bush muhly (*Muhlenbergia porteri*), turpentine bush (*Ericameria laricifolia*), foothill palo verde (*Cercidium microphyllum*), mesquite (*Prosopis spp.*), jojoba (*Simmondsia chinensis*), desert hackberry (*Celtis pallida*) and fairy feather duster (*Calliandra eriophylla*). Average rainfall is approximately 12-15" and elevation ranges from approximately 2800' to 3500'.

### ITEMIZED USE OF FUNDS:

- **11,700 gallon ring tank system without collection point(s) - Coyote Peak and Rock Tank Catchments. These prices not updated as they have been completed.**

Item	Dimensions	Cost	Cost Share	Funds Needed
2-3'x18' fiberglass ring tank (5700g each)	3'x18' each	\$20,020		\$20,020
24'x96' R panel apron	24'x96'	\$7,580		\$7,580
3'x4' walk-in standard trough	3'x4'	\$3,294		\$3,294
Wildlife "friendly" livestock exclosure fence	150'x150'	\$3,390		\$3,390
Plumbing		\$1,000		\$1,000
Tax @ 8.1%		\$2,858		\$2,858
Labor		\$20,000	AGFD, Volunteers	\$0
Total		\$58,142		\$38,142

- **11,700 gallon ring tank system with collection point(s) - North 96 Hills and 96 Ranch #11 – These prices not updated as they have been completed.**

Item	Dimensions	Cost	Cost Share	Funds Needed
2-3'x18' fiberglass ring tank (5700g each)	3'x18' each	\$15,418		\$15,418
24'x96' R panel apron	24'x96'	\$10,779		\$10,779
3'x4' walk-in standard trough	3'x4'	\$2,640		\$2,640
Wildlife "friendly" livestock exclosure fence	150'x150'	\$2,500		\$2,500
Plumbing		\$2,000		\$2,000
Tax @ 8.1%		\$2,700		\$2,700
Backhoe Rental for 1 week		\$1,500		\$1,500
Labor		\$20,000	AGFD, Volunteers	\$0
Total		\$57,537		\$37,537



**\*\*ITEMIZED USE OF FUNDS - PHASE 6 (Final) PRICES:**

- **PVC System - 10,500 gallon - West 96 Hills, Brady Wash, Prospect Hills/Peak Catchments** (costs are identified for one catchment)

Item	Dimensions	Cost	Cost Share	Funds Needed
4- 24"x100' PVC systems (10,000 gallon) \$3250 ea	24"x100' buried	\$14,500		\$14,500
3' walk-in trough for PVC system	3'	\$3,500		\$3,500
Plumbing/collection point components	varies	\$2,000		\$2,000
Piperail livestock exclosure fence	150'x150'	\$3,700		\$3,700
Reinforced concrete sediment trap		\$600		\$600
Permitting – ADWR and ASLD		\$2150		\$2150
Tax @ 9.1%		\$2,407		\$2,407
Labor		\$20,000.00	AGFD, Volunteers	\$0.00
Total		\$48,857	\$20,000	\$28,857
<b>Cost Per Catchment:</b>		<b>\$48,857</b>	<b>\$20,000</b>	<b>\$28,857</b>

- **Remote Digital Monitoring Camera: \$500**

**LIST COOPERATORS AND DESCRIBE POTENTIAL PARTICIPATION:**

Volunteers have logged a total of 841.5 hours worked, 222.25 hours of travel time and 8413 roundtrip miles driven for the completion of Coyote Peak, Rock Tank, North 96 Hills and Brady Wash catchments.

- Each project may be different – below is an all inclusive list of potential cooperators.
  - AGFD Development Branch: acquire the materials and provide equipment and minimal labor for construction if needed.
  - Arizona Deer Association – volunteer labor and equipment
  - Mule Deer Foundation – volunteer labor and equipment
  - Coues Whitetail.com chat room inquiries – volunteer labor and equipment
  - Tucson HPC: coordinate project funding opportunities
  - Arizona State Land Department – Arch and NEPA clearances

**WOULD IMPLEMENTATION OF THIS PROJECT ASSIST IN PROVIDING, MAINTAINING, OR FACILITATING RECREATIONAL ACCESS?**

YES[] NO[X] N/A[]

**PROJECT MONITORING PLAN:**

Remote digital cameras will be used to monitor density and frequency of wildlife water use all year long if cameras are available. This will enable the Wildlife Manager to make better informed decisions for the management of wildlife within GMU 37B.

Water levels will be monitored at least twice per year with emphasis during the warmer drier months by the Wildlife Manager. Additional monitoring will be conducted as needed. Minor maintenance will also be conducted as needed by the Wildlife Manager. The AGFD Development Branch will be responsible for major maintenance issues.

**PROJECT MAINTENANCE:**

The maintenance of each catchment will continue to be the responsibility of the AGFD. The Wildlife Manager will be responsible for coordinating this.

**PROJECT COMPLETION REPORT TO BE FILED BY:**

Ben Brochu

**WATER DEVELOPMENT PROJECTS** *(please use the worksheet below):*

**TREE CLEARING/REMOVAL PROJECTS** *(please use the worksheet below):*

N/A

## **ARIZONA GAME AND FISH DEPARTMENT** **WATER DEVELOPMENT WORKSHEET**

**PROJECT TITLE:** Development of Waters Throughout the 96 Hills – Final Phase

- 1) **Is the water development listed as a priority in the most recent “Wildlife Water Development Annual Implementation Schedule?”**  
Yes
- 2) **Please list the Development Branch personnel and date coordinated with for this project.**  
Joe Currie – August 6, 2007 and July 13, 2010
- 3) **What is the estimated annual inches of precipitation for the area? (mark one)**  
☐2-4   ☐4-6   ☐6-8   ☐8-10   ☐10-12   ☒12-14   ☐14-16   ☐ >16
- 4) **Is there a perennial water source available to big game within four miles of this project?**  
  
YES☒ (please complete #5 below) NO☐ (skip #5 below)
- 5) **For the accessible, perennial water source nearest this project:**  
**See Map 2 for Distances and Distribution**  
Name of water source: Brady Wash, Coyote Peak, 96 Hills #11  
Type of water source (catchment, spring, dirt tank): Catchments  
Ownership of water source: AGFD  
Distance in miles from project: Varies per catchment, see Map 2
- 6) **Is the target wildlife species a result of transplant efforts?** YES☐ NO☒
- 7) **Please list any special land management status for the project site (i.e. Wilderness, National Park, National Monument). If private land, list landowner.**  
N/A
- 8) **Please provide the following information about access to the proposed site:**  
Type of access (mark one): ☒2x4 vehicles   ☐4x4 only   ☐foot only\*\*  
  
\*\*If foot access only: Distance in miles: \_\_\_\_\_ Approximate hiking time: \_\_\_\_\_  
  
-- Does access to this site require crossing private or tribal lands? YES☐ NO☒  
  
-- Please describe any restrictions to public access: None
- 9) **Please list below (or on a separate sheet) the material type and dimensions of each component proposed to be added, modified, or repaired.**  
See Itemized Use of Funds Section above.
- 10) **Was a site visit completed?** Yes☒ No☐  
If Yes, please list personnel that attended and date.  
Joe Currie and I conducted site visits on August 6, 2007, July 13, 2010, September 15, 2011.

## **ARIZONA GAME AND FISH DEPARTMENT**

# **VOLUNTEER HOURLY RATES AND CLASSIFICATIONS WORKSHEET**

**PROJECT TITLE:** \_\_\_\_\_

The value of volunteer labor should be calculated at the hourly rate of an employee doing similar work, or using hourly rates from the Arizona Department of Administration's Human Resource web site, plus a standard ERE rate of 35%. [http://www.hr.az.gov/HR\\_Professional/Class\\_Comp/PDF/alphacovered.pdf](http://www.hr.az.gov/HR_Professional/Class_Comp/PDF/alphacovered.pdf)

\$0.445/mile should be the calculation used for mileage.

<b>Water Development</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			\$14.14	
<b>Habitat Restoration and Clean Up</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			\$14.14	
<b>Fisheries</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			\$14.14	
<b>Nongame Branch Project</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			\$14.14	
<b>Misc/office work</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			varies	
<b>Community Services</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			\$7.44	
<b>Events and Other</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			\$14.14	
<b>Research Branch</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			\$14.14	
<b>Wildlife Area Hosts</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			\$17.44	
<b>Education Programs</b>	<b>Volunteer Hours</b>	<b>Volunteer Miles</b>	<b>Hourly Rate</b>	<b>Estimated Value</b>
			\$16.07	
<b>Totals</b>				